

EXECUTIVE SECRETARIAT ROUTING SLIP

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14 Aug 85

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JCS review completed.

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Executive Registry

85- 2838

THE SECRETARY OF STATE
WASHINGTON

August 12, 1985

Dear Bill:

I agree with the statement on page vi
and trust you are doing something about it.
I am glad to endorse or support the effort
if that would be useful.

With warm personal regards,

Sincerely yours,



George P. Shultz

The Honorable
William J. Casey, Director
Central Intelligence Agency.



P-212



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Intelligence

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US Dependence on Foreign Defense Manufactures: An Emerging Vulnerability

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An Intelligence Assessment

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*GI 85-10177
July 1985*

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US Dependence on Foreign Defense Manufactures: An Emerging Vulnerability

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An Intelligence Assessment

This paper was prepared by the Civil Technology
and Industry Division, Office of Global Issues.
Comments and queries are welcome and may be
directed to the Chief, Civil Technology and Industry
Division, OGI.

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Scope Note

This paper examines US dependence on foreign sources of technology and products and attempts to identify potential vulnerabilities for US strategic interests. It draws from research on foreign industrial capabilities in dual-use technologies important to the US defense sector. This study addresses dependence as it affects the ability of the United States to design, develop, and produce advanced military systems. No effort is made to evaluate US industrial capabilities to respond to rapidly increased military requirements during mobilization. Nor is any effort made to consider all of the possible mobilization scenarios necessary to assess specific risks in a wartime environment.

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**US Dependence on
Foreign Defense Manufactures:
An Emerging Vulnerability**

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Key Judgments

*Information available
as of 28 June 1985
was used in this report.*

The United States is becoming increasingly dependent on foreign sources for inputs into military R&D and production. Most of these inputs are not critical to the performance or production of current military systems, are widely available, and could be produced in the United States in an emergency. Of some concern, however, are certain specialty components, advanced materials, and manufacturing equipment that could become short-term bottlenecks in times of mobilization if not identified in advance. Once identified, a number of actions could be taken to minimize potential problems—stockpiles can be established, alternative suppliers can be located, or in some cases less-than-optimal parts or equipment could be substituted without serious systems degradation.

Of much greater concern is the prospect that the United States could become dependent on foreign sources of advanced technology important to the development and production of future military systems. Our survey has identified several such areas that are key to the performance of a wide array of advanced weapon systems:

While, in our judgment, none of these represent problems for the United States today, failure to establish or retain strong capabilities in these technical areas will place the next generation of US military systems at risk.

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A mix of factors are contributing to the growth of US dependence. In some cases, US industry, skeptical about market opportunities, is not matching current foreign investment and R&D in these new technologies. At the same time, foreign firms are pursuing longer term strategies and targeting niche markets to develop new technological capabilities that they can later extend to broader markets. Foreign firms are also building upon traditional strengths to gain substantial leads in manufacturing processes. If these trends continue, the pace of US technical development in selected areas important to defense programs could begin to lag that of our allies.

This growth in dependence poses policy dilemmas for the United States. Maintaining domestic sources of all manufactured items needed for defense production is unrealistic from a budgetary standpoint; however, failing to sustain strong capabilities in certain militarily important technologies may lead to unacceptable risks. New political initiatives may be necessary to gain access to foreign technologies, but access may be difficult to achieve, given possible foreign reactions to US export control policies.

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We believe a more comprehensive effort is needed to measure foreign content in US weapon systems. Although major military suppliers/subcontractors are well known, no systematic effort has been made to identify ultimate component and materials suppliers. This lack of information creates unnecessary risks because it hinders identification of potential vulnerabilities and disguises areas in which foreign suppliers may play an essential role in the development and manufacture of US military systems.

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US Dependence on Foreign Defense Manufactures: An Emerging Vulnerability

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Introduction

Growing US imports of manufactured goods and the shifting of US manufacturing capacity offshore are raising questions about US dependence on foreign sources of supply and its impact on our national security. Concern centers on US vulnerability if foreign supplies of certain critical components or materials are reduced, seriously hampering US abilities to support military systems development, production, or mobilization. Debate on this issue tends to be highly polarized. On the one hand, some feel that dependence should be avoided at all costs, thus ensuring that our military needs can be met solely from domestic sources. Others, however, point out that growing dependence is a natural consequence of the ongoing integration of the global economy and, as such, benefits the US defense effort by lowering procurement costs and helping to ensure incorporation of leading-edge technologies—whether domestic or foreign.

Many of the differences arise out of a failure to differentiate dependence from vulnerability. Foreign dependence exists when certain research, know-how, manufacturing equipment, materials, parts, or products can be obtained only from foreign-based or foreign-owned sources. Dependence becomes a vulnerability when it can be exploited in a manner adverse to US national security interests. Most dependencies are not vulnerabilities that entail serious national security concerns. Many items are acquired from foreign sources for good economic or business reasons—lower cost or higher quality—and are available from alternative sources. Moreover, many foreign-sourced items do not have strategic significance; for others, substitution possibilities exist, or stockpiles could be established to reduce vulnerability to supply disruption.

Of greatest concern is US reliance on foreign know-how important to the design and manufacture of state-of-the-art military systems (see chart). This dependence is small at present but growing. Special

design and manufacturing know-how are embedded in a number of high technology materials, components, and specialty machine tools already acquired from unique foreign sources. While industry experts believe that the United States currently has the capabilities to produce most of these items if necessary, future prospects are less clear, especially as the number of such items proliferate. The loss of US capabilities to design or produce such high-technology items would constitute severe vulnerabilities in the event of supply disruptions.

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Nature of Military Dependence

The United States has enjoyed a long history of self-sufficiency in the development and manufacture of military systems. Department of Defense R&D funding not only created the technology base for advanced military systems, but also made many important contributions to the commercial sectors of several civilian industries including aircraft, semiconductors, and computers. Defense procurement has received priority attention from key industrial firms, many of which depend upon defense contracts for a large portion of overall revenues. Often this flow of military revenues acts as a counterbalance to cyclical commercial businesses.

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There are signs, however, that this self-sufficiency may be lessening, especially in areas relating to high technology. Military requirements now represent only a small percentage of total output in several high technology industries. For example, only about 10 percent of production from the semiconductor industry goes to defense programs. At the same time, competitive forces, coupled with long development cycles for military systems, are pushing the commercial side of these industries to assimilate leading-edge technologies faster than the military. As a result, the

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Potential Strategic Vulnerability as a Function of Areas of Dependence and Foreign Involvement

Potential vulnerability

- Critical
- Moderate
- Low to none

Dependence Areas	Foreign Involvement		
	Foreign owned/ foreign based	US owned/ foreign based	Foreign owned/ US based
Research	●	●	● ^a
Know-how			
Design	●	●	● ^a
Manufacturing	●	●	●
Manufacturing equipment	● ^b	●	●
Finished product/systems	●	●	● ^c
Components/parts	●	●	●
Feedstock/materials	●	●	●
Service support	●	●	●

^a If facilities contain substantial research activities, vulnerability is low to none.

^b Multiple sources of supply ease the problem.

^c Assuming high-value-added parts from overseas; otherwise low vulnerability.

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technology for some military systems is beginning to lag civil programs, and the military is becoming increasingly dependent on the commercial industrial base for new technology.

Important dependencies begin to emerge when certain of the core industries—microelectronics, machine tools, and telecommunications, for example—are at risk. These industries are currently facing strong foreign competition, weak demand, and, in some cases, worldwide overcapacity. As a consequence, a growing number of US firms are either unable or unwilling to invest in more advanced manufacturing

processes or to continue aggressive technology development for future generation products. Few US semiconductor producers, for example, are matching foreign commitment and investment levels in gallium arsenide (GaAs)—a promising new technology with extensive military applications. Department of Defense funding currently accounts for the bulk of US research on GaAs devices for digital applications; at the same time, little work is being done on advanced,

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high-frequency devices for communications. On another front, the shakeout in the machine tool industry, stemming from intense global competition, means a continuing loss of many small companies with unique capabilities in the design and manufacture of specialty machine tools, including some that are important to arms manufacture. [REDACTED]

As these industries change to meet foreign competition, we believe that emphasis on commercial development may not foster those technological capabilities necessary for future US defense needs. While such a process is a gradual one, we believe the trends are in train. We anticipate that there will be fewer firms with the broad based capabilities, and still fewer specialty firms, providing support to future weapons programs. Indeed, reliance on unique foreign suppliers may be part of a more widespread concern relating to single-source dependencies—domestic as well as foreign. [REDACTED]

The Issue of Know-How

The issue of know-how is central to the military dependence concerns associated with high technology items. The potential problems are much more complex than simply ensuring future sources of supply. In many cases, key design and manufacturing know-how, as well as specialized equipment, are required to produce these items. Moreover, a thorough understanding of basic materials properties and manufacturing processes, accumulated from extensive research and manufacturing experience, is often necessary to apply leading-edge technologies to special military applications. Once the base of design and manufacturing know-how shifts overseas, reestablishing domestic capabilities in an emergency becomes increasingly difficult with subsequent product generations. In many cases, modifications of manufacturing processes for related products will not suffice. [REDACTED]

US dependence on foreign know-how is minimal at present, but we believe the risks over time could be great. For the most part, the United States is self-sufficient in most technologies and is a leader in most broad technological fields. Nevertheless, areas of foreign excellence are increasing, particularly as foreign governments—recognizing the importance of high

technology industries for future growth and employment—actively support a wide variety of R&D initiatives. Such initiatives are enhanced by US coproduction programs, joint development efforts, and technology licensing agreements with foreign firms. Some countries have clearly closed the technology gap during the past few decades and have begun to challenge US leadership in certain industrial areas. [REDACTED]

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Current Dependencies

There are a variety of materials, components, and equipment, important to military programs, for which the United States is now dependent on foreign sources of supply. Many of these items are relatively unsophisticated, easy to produce, and therefore bought solely on a price basis. Industry experts believe that US producers could, in an emergency, establish domestic production capabilities within months in these areas. [REDACTED]

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Special Parts and Materials

For a small but growing number of special parts and materials, however, foreign producers have developed proprietary processes or have accumulated manufacturing experience that cannot be quickly acquired by US firms. In some instances, US companies have not made the necessary investments in new production processes and have chosen not to continue development in areas viewed as less promising commercially. Foreign firms, on the other hand, have sometimes taken a longer range view and pursued aggressive technology development in the anticipation that major markets would evolve. We believe that, in an emergency, US efforts to build domestic capacity for items [REDACTED]

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[REDACTED] could be frustrated by a lack of production experience. [REDACTED]

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Specialty Manufacturing Equipment

Erosion of the US industrial base is having a pronounced impact on the machine tool industry. For example, about 40 percent of US machine tool purchases now come from abroad, compared with only 15 percent in 1975. Although US capacity to manufacture general purpose machine tools has remained substantial, our ability to manufacture highly specialized equipment—such as flow forming and composite weaving machines—is slipping. [REDACTED]

US manufacturers of machine tools and other production equipment have been unable or unwilling to devote resources to the development of highly specialized production equipment. Because markets for specialized equipment are often small and very cyclical, firms often forgo development of these products in favor of larger volume, general purpose equipment. Moreover, many of the firms producing specialized tools are very small; it is likely that a number of them will not survive the growing global competition in this highly cyclical industry. Consequently, the US military has been forced to turn to foreign suppliers for certain state-of-the-art requirements; either comparable US equipment is not available or substitutes are less productive. [REDACTED]

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US Vulnerability

Vulnerabilities associated with these high technology sectors could grow more serious over time. The more rapidly these technologies move ahead overseas and the longer US firms delay establishing manufacturing capabilities, the more difficult entry may become. Even if US scientific research in these areas remains at the forefront, US abilities to establish manufacturing capabilities quickly are questionable. Many areas of high technology manufacture and process and quality control are refined only through the cumulative experience in production. []

Even if access to foreign research activities is gained, US defense contractors may be less likely to incorporate this foreign know-how into future military systems designs. At the top of the defense supplier network are a relatively small number of firms that not only produce finished systems themselves, but also provide basic research and design functions. The conceptualization of new systems by these companies draws on technologies in which they or their immediate suppliers have strength. As a consequence, future US military systems may not take advantage of the best technologies available. []

Dependencies of Little Concern

Of little concern are a myriad of standard items for which the United States is dependent on foreign sources of supply. These items do not represent vulnerabilities. More than half of US demand for industrial fasteners, for example, is met by foreign imports, mostly from Japan and Taiwan. US producers, facing slack demand and stiff foreign competition, have cut production capacity by more than 20 percent since 1979, and domestic production facilities now lack the capacity to meet US demand during the peak of the business cycle. Most industry experts believe, however, that US producers could, in an emergency, sharply increase output by activating mothballed capacity or by converting existing capacity in related production facilities. []

Factors Affecting US Dependence

A number of trends are under way in the world economy that serve to increase US dependence on foreign sources of supply. These include the growing internationalization of business, the greater use of joint ventures, and the spread of licensing and technology exchange agreements. The increase in US imports of manufactured goods and the parallel shift to offshore production are the most visible indicators of these trends. US imports of foreign manufactures increased from \$11 billion in 1965 to almost \$25 billion in 1970 and to more than \$220 billion in 1984. As a result, US imports of manufactures as a share of

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manufacturing output jumped from less than 10 percent in 1970 to over 24 percent in 1983. For certain products the share is much higher; for example, imports of 256K DRAMs account for 90 percent of US consumption. []

The growing internationalization of business is central to the shift to offshore dependence. Both US and foreign companies are seeking equity participation in foreign counterparts and are gaining access to proprietary know-how and sometimes management influence or control. A growing number of major US manufacturing firms are pooling their financial resources, technology, and marketing expertise with foreign interests because of the great expense in launching many new products. Even small firms with leading-edge technologies are seeking tieups with foreign companies that have the capital needed to commercialize those technologies. The net effect of all this is that a growing number of US business executives are making decisions on a global, rather than a domestic, basis. As a result, the United States as a national entity will become less self-reliant in its ability to develop and manufacture the full range of products sold in domestic and international markets. []

The shift to offshore operations may be accelerating, in part because of the factors noted above as well as the strength of the US dollar. There have always been incentives to locate plants outside the United States—access to markets, savings on shipping and tariffs, and direct tax breaks. But the continued strength of the dollar is convincing more US companies to move their operations overseas to reduce their dollar costs. According to Department of Commerce figures, US manufacturers plan a 22-percent increase in capital spending for plant and equipment abroad this year, almost double planned expenditures domestically. While the bulk of US offshore manufacturing has been aimed at low technology, high labor-content products—consumer and heavy industrial goods—or low level assembly operations for high technology products, increased US manufacturing abroad is beginning to include more dual-use technologies important to military as well as civil applications. Indeed, more than two-thirds of US integrated circuit production is already assembled and packaged offshore according to US trade data. Several semiconductor

manufacturers have also established design centers and production facilities overseas, and one US manufacturer is producing most of its advanced semiconductor memory products abroad. []

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To remain competitive, US producers may be forced to move or build their most advanced manufacturing operations overseas. Over time, the transfer back to the United States of manufacturing technology refined in these plants may be increasingly difficult. From a military standpoint, these problems are offset to some extent by DoD regulations requiring that certain key items be manufactured in the United States or that second-source US capabilities be maintained. These DoD regulations, however, are not likely to dissuade offshore investment by US firms that have a small part of their overall business in the defense sector. []

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Outlook and Implications

We believe that US dependence on foreign manufactures will continue to grow. Deepening dependence will be driven by rapidly developing technology levels abroad, the emergence of new competitors—especially in the newly industrialized countries—and by the application of newer technologies to older industries. In addition, increasing costs of research, development, and manufacturing, as well as the need to ensure market access, will continue to foster an internationalization of many industries. []

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Several factors will affect the magnitude and scope of future US dependence. International shifts in comparative advantage will continually change the mix of industries in which the United States retains a strong indigenous manufacturing base. Not only will capacity in basic industrial sectors, like steel and chemicals, shift to nations with lower labor and energy costs, but portions of high technology industries—especially high-volume commodity products—are likely to move offshore to countries with manufacturing cost advantages. Moreover, international mergers and alliances probably will play a more important role in increasing

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US Government Regulations on Foreign Acquisition

Department of Defense policies and selected portions of the Federal Acquisition Regulation (FAR) restrict conditions under which foreign materials, components, and products/systems may be procured. At the same time, they provide a means for preserving or establishing US production capabilities for items judged critical to defense programs. Specifically, DoD FAR Supplement Part 25 includes procedures to implement the so-called Buy American Act requiring that all weapon systems procured have 51-percent US content (by cost). Exempted are articles, materials, and supplies:

- *For use outside the United States.*
- *For which domestic costs would be unreasonable.*
- *For which it is determined that domestic preference would be inconsistent with the public interest.*
- *That are determined not to be mined, produced, or manufactured in sufficient quantity or quality in the United States.*
- *Or that are purchased specifically for commissary sale.*

DoD FAR Supplement Part 8 calls for 100-percent US manufacture for certain items procured, such as miniature ball bearings. (S NF)

In practice, these policies and regulations are implemented in various ways depending on the weapons program, the mission, and the military service responsible. For foreign-sourced components judged critical to major weapon systems, for example cannon tubes, establishment of domestic manufacturing capabilities is normally required. For certain military systems, such as jet engines, all components must have at least second sources in the United States.

dependence than they have up to now. Those industries whose survivability requires large-scale investments in plant and equipment or R&D may look increasingly to foreign partners. The aircraft and automobile industries have already moved in this direction, and others are likely to follow.

At risk are those product and technology sectors, key to US defense programs, in which development may be slowed by poor market or competitive conditions.

Companies with narrow product lines that are important for military applications—supercomputers, for example—may lack the resources to keep pace with larger, diversified foreign corporations in developing future generation products. Even those companies for which US military sales weigh heavily in overall corporate planning may be forced to move a growing portion of their manufacturing operations overseas to remain competitive.

This growth in dependence poses policy dilemmas for the United States. Maintaining domestic sources of all manufactured items needed for defense production is unrealistic from a budgetary standpoint. Failing to retain a sufficient infrastructure in certain critical technologies, however, may lead to vulnerabilities in the future. US programs aimed at increasing cooperation with our West European and Japanese allies in the development and production of military goods may foster additional dependencies in certain areas of technology. Moreover, access to leading-edge foreign technologies may be difficult to achieve, given possible foreign reactions to US controls on the transfer of military technologies.

There are a variety of strategies that could be taken to minimize some of these vulnerabilities. For materials, parts, and manufacturing equipment, alternate suppliers can be identified, stockpiles can be established, and, in some cases, less-than-optimal parts could be substituted without excessive systems degradation. In some instances, dependence on foreign equipment suppliers can be avoided by varying production processes and making some compromises in quality or productivity. Those vulnerabilities that center on research and manufacturing/design know-how, however, are far less amenable to easy solution.

New political initiatives may be necessary to gain access to foreign technologies. If access is maintained, it would help ensure that the best available technology could be incorporated into new US military systems. Even if governments agree to exchange technologies, corporations may be unwilling to share dual-use technology that they deem important for commercial advantage.

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